WEST Search History

DATE: Monday, December 30, 2002

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT,PGPB,JPAB,EPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ			
L7	L6 and mortierella	11	L7
L6	L5 and (host cell or recombinant cell or dna or cdna or gene)	1680	L6
L5	(desaturase or oxidase or oxidoreductase) and (carbon adj 6 or C adj2 6)	2364	L5
L4	L2 and (carbon 6 or C adj2 6)	9	L4
L3	L2 and carbon 6	6	L3
L2	mortierella alpina and (desaturase or oxidase or oxidoreductase)	38	L2
L1	morterella alpina and (desaturase or oxidase or oxidoreductase)	0	L1

END OF SEARCH HISTORY

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Search Results - Record(s) 1 through 9 of 9 returned.

☐ 1. Document ID: US 20020146784 A1

L4: Entry 1 of 9 File: PGPB Oct 10, 2002

PGPUB-DOCUMENT-NUMBER: 20020146784
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020146784 A1

TITLE: METHOD FOR PRODUCING HIGHLY UNSATURATED FATTY ACIDS AND LIPID CONTAINING SAME

PUBLICATION-DATE: October 10, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
SUZUKI, OSAMU	HIROSHIMA		JP	
ONO, KAZUHISA	HIROSHIMA		JP	
SHIGETA, SEIKO	HIROSHIMA		JP	
AKI, TSUNEHIRO	HIROSHIMA		JP	
AKIMOTO, KENGO	OSAKA		JP	

US-CL-CURRENT: 435/134; 435/254.1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20010021522 A1

L4: Entry 2 of 9 File: PGPB Sep 13, 2001

PGPUB-DOCUMENT-NUMBER: 20010021522
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010021522 A1

TITLE: Process for production of dihomo-gamma-linolenic acid and lipid containing same

PUBLICATION-DATE: September 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Kawashima, Hiroshi	Osaka		JP	
Akimoto, Kengo	Osaka		JP	
Yamada, Hideaki	Kyoto-shi		JP	
Shimizu, Sakayu	Kyoto-shi		JP	

US-CL-CURRENT: 435/134

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

☐ 3. Document ID: US 6459018 B1

L4: Entry 3 of 9 File: USPT Oct 1, 2002

US-PAT-NO: 6459018
DOCUMENT-IDENTIFIER: US 6459018 B1

TITLE: Polyunsaturated fatty acids in plants

DATE-ISSUED: October 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Debbie	Granite Bay	CA		

US-CL-CURRENT: 800/281; 435/419, 435/468, 435/69.1, 800/298

ABSTRACT:

The present invention relates to compositions and methods for preparing polyunsaturated long chain fatty acids in plants, plant parts and plant cells, such as leaves, roots, fruits and seeds. Nucleic acid sequences and constructs encoding fatty acid desaturases, including .DELTA.5-desaturases, .DELTA.6-desaturases and .DELTA.12-desaturases, are used to generate transgenic plants, plant parts and cells which contain and express one or more transgenes encoding one or more desaturases. Expression of the desaturases with different substrate specificities in the plant system permit the large scale production of polyunsaturated long chain fatty acids such as docosahexaenoic acid, eicosapentaenoic acid, .alpha.-linolenic acid, gamma-linolenic acid, arachidonic acid and the like for modification of the fatty acid profile of plants, plant parts and tissues. Manipulation of the fatty acid profiles allows for the production of commercial quantities of novel plant oils and products.

12 Claims, 2 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 2

☐ 4. Document ID: US 6410288 B1

L4: Entry 4 of 9 File: USPT Jun 25, 2002

US-PAT-NO: 6410288
DOCUMENT-IDENTIFIER: US 6410288 B1

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids

DATE-ISSUED: June 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Westerville	OH		

US-CL-CURRENT: 435/189; 536/23.2

ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been

'desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

20 Claims, 19 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

☐ 5. Document ID: US 6280982 B1

L4: Entry 5 of 9 File: USPT Aug 28, 2001

US-PAT-NO: 6280982
DOCUMENT-IDENTIFIER: US 6280982 B1

TITLE: Process for production of dihomo-.gamma.-linolenic acid and lipid containing same

DATE-ISSUED: August 28, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kawashima; Hiroshi	Ibaraki			JP
Akimoto; Kengo	Ibaraki			JP
Yamada; Hideaki	Kyoto			JP
Shimizu; Sakayu	Kyoto			JP

US-CL-CURRENT: 435/134; 435/136, 435/187

ABSTRACT:

A process for the production of dihomo-.gamma.-linolenic acid comprising the steps of culturing a microorganism having an ability to produce araquidonic acid and having a reduced or lost .DELTA.5 desaturase activity to produce dihomo-.gamma.-linolenic acid or a lipid containing dihomo-.gamma.-linolenic acid, and recovering the dihomo-.gamma.-linolenic acid.

28 Claims, 0 Drawing figures
Exemplary Claim Number: 1

☐ 6. Document ID: US 6136574 A

L4: Entry 6 of 9 File: USPT Oct 24, 2000

US-PAT-NO: 6136574
DOCUMENT-IDENTIFIER: US 6136574 A

TITLE: Methods and compositions for synthesis of long chain polyunsaturated fatty acids

DATE-ISSUED: October 24, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Pearland	TX		

US-CL-CURRENT: 435/134; 435/136

ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

22 Claims, 18 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

☐ 7. Document ID: US 6075183 A

L4: Entry 7 of 9 File: USPT Jun 13, 2000

US-PAT-NO: 6075183
DOCUMENT-IDENTIFIER: US 6075183 A

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids in plants

DATE-ISSUED: June 13, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Pearland	TX		

US-CL-CURRENT: 800/281; 435/134, 435/252.3, 435/419, 435/430, 435/468, 435/471, 435/69.1, 536/23.2, 800/298

ABSTRACT:

The present invention relates to compositions and methods for preparing poly-unsaturated long chain fatty acids in plants, plant parts and plant cells, such as leaves, roots, fruits and seeds. Nucleic acid sequences and constructs encoding fatty acid desaturases, including .DELTA.5-desaturases, .DELTA.6-desaturases and .DELTA.12-desaturases, are used to generate transgenic plants, plant parts and cells which contain and express one or more transgenes encoding one or more desaturases. Expression of the desaturases with different substrate specificities in the plant system permit the large scale production of poly-unsaturated long chain fatty acids such as docosahexaenoic acid, eicosapentaenoic acid, .alpha.-linoleic acid, gamma-linolenic acid, arachidonic acid and the like for modification of the fatty acid profile of plants, plant parts and tissues. Manipulation of the fatty acid profiles allows for the

"production of commercial quantities of novel plant oils and products.

22 Claims, 7 Drawing figures
Exemplary Claim Number: 19
Number of Drawing Sheets: 17

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw. Desc | Image

☐ 8. Document ID: US 5968809 A

L4: Entry 8 of 9 File: USPT Oct 19, 1999

US-PAT-NO: 5968809
DOCUMENT-IDENTIFIER: US 5968809 A

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids

DATE-ISSUED: October 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Westerville	OH		

US-CL-CURRENT: 435/254.2; 435/189, 435/254.21, 435/320.1, 435/325, 435/410, 536/23.1, 536/23.2, 536/23.7, 536/23.74, 536/24.32

ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

30 Claims, 18 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWIC | Draw. Desc | Image

☐ 9. Document ID: WO 9846763 A1 US 6410288 B1 AU 9869616 A US 5968809 A NO 9904925 A EP 975766 A1 EP 996732 A1 CZ 9903583 A3 BR 9808507 A CN 1252099 A SK 9901398 A3 CN 1253588 A NZ 337457 A NZ 337459 A HU 200001236 A2 US 6136574 A AU 726807 B MX 9909328 A1 MX 9909329 A1 KR 2001006257 A KR 2001006258 A JP 2001523091 W

L4: Entry 9 of 9 File: DWPI Oct 22, 1998

DERWENT-ACC-NO: 1998-594582
DERWENT-WEEK: 200246

TITLE: New isolated fatty acid desaturase enzymes - used for the production of polyunsaturated fatty acids for use in, e.g. pharmaceutical compositions, nutritional compositions, cosmetics or animal feed

INVENTOR: CHAUDHARY, S; HUANG, Y ; KNUTZON, D ; LEONARD, A E ; MUKERJI, P ; THURMOND, J

PRIORITY-DATA: 1997US-0834655 (April 11, 1997), 1997US-0833610 (April 11, 1997), 1997US-0834033 (April 11, 1997), 1997US-0956985 (October 24, 1997), 1999US-0363574 (July 29, 1999), 1998WO-US07421 (April 10, 1998), 1999US-0363526 (July 29, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 9846763 A1	October 22, 1998	E	165	C12N015/53
US 6410288 B1	June 25, 2002		000	C12N009/02
AU 9869616 A	November 11, 1998		000	
US 5968809 A	October 19, 1999		000	C12N001/16
NO 9904925 A	November 30, 1999		000	C12N000/00
EP 975766 A1	February 2, 2000	E	000	
EP 996732 A1	May 3, 2000	E	000	C12N015/53
CZ 9903583 A3	May 17, 2000		000	C12N015/53
BR 9808507 A	May 23, 2000		000	C12N015/53
CN 1252099 A	May 3, 2000		000	C12N015/53
SK 9901398 A3	May 16, 2000		000	C12N015/53
CN 1253588 A	May 17, 2000		000	C12N015/53
NZ 337457 A	July 28, 2000		000	A61K031/20
NZ 337459 A	July 28, 2000		000	A61K031/20
HU 200001236 A2	July 28, 2000		000	C12N015/53
US 6136574 A	October 24, 2000		000	C12P007/64
AU 726807 B	November 23, 2000		000	C12N015/53
MX 9909328 A1	September 1, 2000		000	C12N015/53
MX 9909329 A1	September 1, 2000		000	C12N015/53
KR 2001006257 A	January 26, 2001		000	C12N015/53
KR 2001006258 A	January 26, 2001		000	C12N015/82
JP 2001523091 W	November 20, 2001		174	C12N015/09

AU 726807 B INT-CL (IPC): A23 K 1/00; A23 K 1/16; A23 L 1/28; A23 L 1/30; A61 K 7/00; A61 K 31/20; A61 K 31/202; A61 K 31/232; A61 K 38/00; A61 P 17/00; C07 H 21/04; C11 B 1/00; C12 N 0/00; C12 N 1/16; C12 N 1/19; C12 N 5/10; C12 N 9/02; C12 N 15/09; C12 N 15/53; C12 N 15/81; C12 N 15/82; C12 P 7/64

ABSTRACTED-PUB-NO: US 5968809A
BASIC-ABSTRACT:

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10)

a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).
ABSTRACTED-PUB-NO:

US 6136574A EQUIVALENT-ABSTRACTS:

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from

carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic

encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).

US 6410288B

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).

WO 9846763A

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Clip Img | Image

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Search Results - Record(s) 1 through 11 of 11 returned.

☐ 1. Document ID: US 20020045660 A1

L7: Entry 1 of 11 File: PGPB Apr 18, 2002

PGPUB-DOCUMENT-NUMBER: 20020045660
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020045660 A1

TITLE: Infant formulas containing long-chain polyunsaturated fatty acids and uses thereof

PUBLICATION-DATE: April 18, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
O'Connor, Deborah L.	North York	OH	CA	
Auestad, Nancy	Columbus	MO	US	
Fitzgerald-Gustafson, Kathleen	Kansas City	CA	US	
Halter, Robin	San Diego	OR	US	
Janowsky, Jeri	Portland	OH	US	
Merritt, Russell J.	Columbus	OR	US	
Neuringer, Martha	Portland	OH	US	
Singer, Lynn T.	Cleveland Heights		US	

US-CL-CURRENT: 514/560; 424/439

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWMC | Draw. Desc | Image

☐ 2. Document ID: US 20020004527 A1

L7: Entry 2 of 11 File: PGPB Jan 10, 2002

PGPUB-DOCUMENT-NUMBER: 20020004527
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020004527 A1

TITLE: Infant formulas containing long-chain polyunsaturated fatty acids and uses thereof

PUBLICATION-DATE: January 10, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Auestad, Nancy	Columbus	OH	US	
Merritt, Russell J.	Columbus	OH	US	
O' Connor, Deborah L.	North York		CA	

US-CL-CURRENT: 514/560; 424/439, 426/590

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments KWMC | Draw. Desc | Image

☐ 3. Document ID: US 6495599 B2

L7: Entry 3 of 11 File: USPT Dec 17, 2002

US-PAT-NO: 6495599
DOCUMENT-IDENTIFIER: US 6495599 B2

TITLE: Infant formulas containing long-chain polyunsaturated fatty acids and uses therof

DATE-ISSUED: December 17, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Auestad; Nancy	Columbus	OH		
Merritt; Russell J.	Columbus	OH		
O'Connor; Deborah L.	North York			CA

US-CL-CURRENT: 514/560

ABSTRACT:

Methods for providing nutrition and for enhancing neurological development of preterm infants are disclosed. Also disclosed is an improved nutritional composition containing specified amounts of DHA and AA as well as their precursor essential fatty acids alpha-linolenic and linoleic acids. The methods involve feeding LCP supplemented, nutrient-enriched formulas for an extended feeding regimen, typically until at least 3 months corrected age (CA), preferably to 6 or even 12 months CA. The neurological developments, for example, visual development, motor development and language development were enhanced without findings of anthropometric growth faltering or inhibition.

45 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 4. Document ID: US 6459018 B1

L7: Entry 4 of 11 File: USPT Oct 1, 2002

US-PAT-NO: 6459018
DOCUMENT-IDENTIFIER: US 6459018 B1

TITLE: Polyunsaturated fatty acids in plants

DATE-ISSUED: October 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Debbie	Granite Bay	CA		

US-CL-CURRENT: 800/281; 435/419, 435/468, 435/69.1, 800/298

ABSTRACT:

The present invention relates to compositions and methods for preparing polyunsaturated long chain fatty acids in plants, plant parts and plant cells, such as leaves, roots, fruits and seeds. Nucleic acid sequences and constructs encoding fatty acid desaturases, including .DELTA.5-desaturases, .DELTA.6-desaturases and .DELTA.12-desaturases, are used to generate transgenic plants, plant parts and cells which contain and express one or more transgenes encoding one or more desaturases. Expression of the desaturases with different substrate specificities in the plant system permit the large scale production of polyunsaturated long chain fatty acids such as docosahexaenoic acid, eicosapentaenoic acid, .alpha.-linolenic acid, gamma-linolenic acid, arachidonic acid and the like for modification of the fatty acid profile

of plants, plant parts and tissues. Manipulation of the fatty acid profiles allows for the production of commercial quantities of novel plant oils and products.

12 Claims, 2 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments

KWIC | Draw. Desc | Image

☐ 5. Document ID: US 6432672 B1

L7: Entry 5 of 11 File: USPT Aug 13, 2002

US-PAT-NO: 6432672
DOCUMENT-IDENTIFIER: US 6432672 B1

TITLE: Gene conversion as a tool for the construction of recombinant industrial filamentous fungi

DATE-ISSUED: August 13, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Selten; Gerardus Cornelis Maria	2651 HZ Berkel EN Rodenrijs			NL
Swinkels; Bart Willem	2611 MX Delft			NL
Bovenberg; Roelof Ary Lans	3062 ZD Rotterdam			NL

US-CL-CURRENT: 435/69.1; 435/254.11, 435/254.3, 435/254.4, 435/254.5, 435/254.6, 435/254.7, 435/254.8, 435/254.9, 435/477

ABSTRACT:

The present invention relates to filamentous fungi that comprise in their genomes at least two substantially homologous DNA domains which are suitable for integration of one or more copies of a recombinant DNA molecule and wherein at least two of these DNA domains comprise an integrated copy of a recombinant DNA molecule. The invention also relates to methods for preparing such filamentous fungi and for further multiplying the DNA domains with integrated recombinant DNA molecules through gene conversion or amplification.

29 Claims, 65 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 69

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments

KWIC | Draw. Desc | Image

☐ 6. Document ID: US 6410288 B1

L7: Entry 6 of 11 File: USPT Jun 25, 2002

US-PAT-NO: 6410288
DOCUMENT-IDENTIFIER: US 6410288 B1

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids

DATE-ISSUED: June 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Westerville	OH		

US-CL-CURRENT: 435/189; 536/23.2

ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

20 Claims, 19 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

☐ 7. Document ID: US 6136574 A

L7: Entry 7 of 11 File: USPT Oct 24, 2000

US-PAT-NO: 6136574
DOCUMENT-IDENTIFIER: US 6136574 A

TITLE: Methods and compositions for synthesis of long chain polyunsaturated fatty acids

DATE-ISSUED: October 24, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Pearland	TX		

US-CL-CURRENT: 435/134; 435/136

ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

22 Claims, 18 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 8. Document ID: US 6075183 A

L7: Entry 8 of 11 File: USPT Jun 13, 2000

US-PAT-NO: 6075183
DOCUMENT-IDENTIFIER: US 6075183 A

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids in plants

DATE-ISSUED: June 13, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Pearland	TX		

US-CL-CURRENT: 800/281; 435/134, 435/252.3, 435/419, 435/430, 435/468, 435/471, 435/69.1, 536/23.2, 800/298

ABSTRACT:

The present invention relates to compositions and methods for preparing poly-unsaturated long chain fatty acids in plants, plant parts and plant cells, such as leaves, roots, fruits and seeds. Nucleic acid sequences and constructs encoding fatty acid desaturases, including .DELTA.5-desaturases, .DELTA.6-desaturases and .DELTA.12-desaturases, are used to generate transgenic plants, plant parts and cells which contain and express one or more transgenes encoding one or more desaturases. Expression of the desaturases with different substrate specificities in the plant system permit the large scale production of poly-unsaturated long chain fatty acids such as docosahexaenoic acid, eicosapentaenoic acid, .alpha.-linoleic acid, gamma-linolenic acid, arachidonic acid and the like for modification of the fatty acid profile of plants, plant parts and tissues. Manipulation of the fatty acid profiles allows for the production of commercial quantities of novel plant oils and products.

22 Claims, 7 Drawing figures
Exemplary Claim Number: 19
Number of Drawing Sheets: 17

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 9. Document ID: US 5968809 A

L7: Entry 9 of 11 File: USPT Oct 19, 1999

US-PAT-NO: 5968809
DOCUMENT-IDENTIFIER: US 5968809 A

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids

DATE-ISSUED: October 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Westerville	OH		

US-CL-CURRENT: 435/254.2; 435/189, 435/254.21, 435/320.1, 435/325, 435/410, 536/23.1, 536/23.2, 536/23.7, 536/23.74, 536/24.32

ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

30 Claims, 18 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

☐ 10. Document ID: US 5612208 A

L7: Entry 10 of 11 File: USPT Mar 18, 1997

US-PAT-NO: 5612208
DOCUMENT-IDENTIFIER: US 5612208 A

TITLE: Ascorbate oxidase, gene encoding the same, process for producing the same, and reagent composition using the same

DATE-ISSUED: March 18, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nakanishi; Yuji	Aichi			JP
Amano; Hitoshi	Ibaraki			JP
Yamaguchi; Shotaro	Ibaraki			JP

US-CL-CURRENT: 435/189; 426/541, 426/656, 435/25, 435/252.3, 435/254.11, 435/254.21, 435/254.3, 435/254.5, 435/28, 435/320.1, 435/325, 536/23.2

ABSTRACT:

The present invention provides a novel ascorbate oxidase (ASOD) which catalyzes oxidation reaction of L-ascorbic acid with molecular oxygen to form L-dehydroascorbic acid and hydrogen peroxide, a process for producing the ascorbate oxidase comprising using a microorganism belonging to the genus Eupenicillium, a gene encoding ASOD, a transformant containing such a gene, a process for producing ASOD using such a transformant, and a reagent composition comprising ASOD, such as a reagent composition for examination, a food additive, and a reagent composition in the fields of food and clinical examination. The ascorbate oxidase has excellent stability particularly in a liquid state.

11 Claims, 14 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 13

☐ 11. Document ID: WO 9846763 A1 US 6410288 B1 AU 9869616 A US 5968809 A NO 9904925 A EP 975766 A1 EP 996732 A1 CZ 9903583 A3 BR 9808507 A CN 1252099 A SK 9901398 A3 CN 1253588 A NZ 337457 A NZ 337459 A HU 200001236 A2 US 6136574 A AU 726807 B MX 9909328 A1 MX 9909329 A1 KR 2001006257 A KR 2001006258 A JP 2001523091 W

L7: Entry 11 of 11 File: DWPI Oct 22, 1998

DERWENT-ACC-NO: 1998-594582
DERWENT-WEEK: 200246

TITLE: New isolated fatty acid desaturase enzymes - used for the production of polyunsaturated fatty acids for use in, e.g. pharmaceutical compositions, nutritional compositions, cosmetics or animal feed

INVENTOR: CHAUDHARY, S; HUANG, Y ; KNUTZON, D ; LEONARD, A E ; MUKERJI, P ; THURMOND, J

PRIORITY-DATA: 1997US-0834655 (April 11, 1997), 1997US-0833610 (April 11, 1997), 1997US-0834033 (April 11, 1997), 1997US-0956985 (October 24, 1997), 1999US-0363574 (July 29, 1999), 1998WO-US07421 (April 10, 1998), 1999US-0363526 (July 29, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 9846763 A1	October 22, 1998	E	165	C12N015/53
US 6410288 B1	June 25, 2002		000	C12N009/02
AU 9869616 A	November 11, 1998		000	
US 5968809 A	October 19, 1999		000	C12N001/16
NO 9904925 A	November 30, 1999		000	C12N000/00
EP 975766 A1	February 2, 2000	E	000	
EP 996732 A1	May 3, 2000	E	000	C12N015/53
CZ 9903583 A3	May 17, 2000		000	C12N015/53
BR 9808507 A	May 23, 2000		000	C12N015/53
CN 1252099 A	May 3, 2000		000	C12N015/53
SK 9901398 A3	May 16, 2000		000	C12N015/53
CN 1253588 A	May 17, 2000		000	C12N015/53
NZ 337457 A	July 28, 2000		000	A61K031/20
NZ 337459 A	July 28, 2000		000	A61K031/20
HU 200001236 A2	July 28, 2000		000	C12N015/53
US 6136574 A	October 24, 2000		000	C12P007/64
AU 726807 B	November 23, 2000		000	C12N015/53
MX 9909328 A1	September 1, 2000		000	C12N015/53
MX 9909329 A1	September 1, 2000		000	C12N015/53
KR 2001006257 A	January 26, 2001		000	C12N015/53
KR 2001006258 A	January 26, 2001		000	C12N015/82
JP 2001523091 W	November 20, 2001		174	C12N015/09

AU 726807 B INT-CL (IPC): A23 K 1/00; A23 K 1/16; A23 L 1/28; A23 L 1/30; A61 K 7/00; A61 K 31/20; A61 K 31/202; A61 K 31/232; A61 K 38/00; A61 P 17/00; C07 H 21/04; C11 B 1/00; C12 N 0/00; C12 N 1/16; C12 N 1/19; C12 N 5/10; C12 N 9/02; C12 N 15/09; C12 N 15/53; C12 N 15/81; C12 N 15/82; C12 P 7/64

ABSTRACTED-PUB-NO: US 5968809A
BASIC-ABSTRACT:

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide

which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).
ABSTRACTED-PUB-NO:

US 6136574A EQUIVALENT-ABSTRACTS:

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids,

where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining

altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

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